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a support member which supports the at least one superconducting winding; and

an electromagnetic shield surrounding the cryostat and the at least one superconducting winding.

In the Abstract:

Please substitute the attached abstract for the originally filed abstract.

In the Drawings:

Please substitute in the attached FIG. 1 for the originally filed FIG. 1.

Section 112 rejections

Applicant amends claim 7 to recite an induction structure in place of an electromagnetic shield member. Antecedent basis for the induction structure exists in claim 4, from which claim 7 depends. Applicant also amends claim 17 to eliminate the reference to a stator assembly. This amendment resolves the antecedent basis problem noted by the Examiner and harmonizes the language of that claim with claim 1. The §112 rejection of claims 18-20 appears to arise from their dependence on claim 17. Accordingly, Applicant submits that the foregoing amendments address all § 112 rejections.

Objection to drawing

Applicant submits, for the Examiner's consideration, a revised FIG. 1 with the reference number "30" of the winding noted in red. FIG. 1 now conforms with FIG. 2, which clearly shows a partial cut-away view of the winding in FIG. 1. No new matter is introduced.

Objection to abstract

Applicant submits a revised abstract that conforms with the guidelines set forth in the Office Action. This revised abstract is the originally filed abstract condensed into one paragraph to conform to those guidelines.

Applicant's claimed invention

Applicant's electric motor operates in two distinct, and mutually exclusive modes: a synchronous mode and an induction mode. Which mode Applicant's motor operates in depends upon the temperature of the windings (30). When the windings are kept cold enough to be superconducting, the current in the windings generates a magnetic field that locks onto a rotating magnetic field generated by the stator windings.[1] As a result, the motor operates in synchronous mode. If, however, the cooling system breaks down and the windings (30) lose their superconductivity, the rotor will begin to slip relative to the rotating magnetic field generated by the stator windings. Because the outermost conductive layers of the rotor will now be in the presence of a time-varying magnetic field, currents will be induced in those layers. The interaction of those induced currents with the rotating magnetic field causes Applicant's motor to operate as an induction motor.[2]

Applicant's electric motor thus shifts seamlessly between operating as a synchronous motor and operating as an induction motor. This feature of Applicant's electric motor is made manifest in claim 1's recitation of a rotor assembly

> "configured to operate in a synchronous mode of operation at temperatures wherein the superconducting winding exhibits superconducting characteristics and in a steady-state induction mode of operation at temperatures wherein the superconducting winding exhibits non-superconducting characteristics"[3]

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[1] *Applicant's specification*, page 9, lines 18-30.
[2] *Applicant's specification*, page 9, line 31- page 10, line 9.
[3] *Applicant's specification*, stet 10, line 7-13.

Section 102(*e*) rejection

In rejecting Applicant's independent claims, The Examiner suggest that the *Rabinowitz* coil module (44) corresponds to Applicant's claimed superconducting winding. Given this correspondence, in order for *Rabinowitz* to anticipate Applicant's claimed subject matter, there must be some teaching in *Rabinowitz* of a transition between a synchronous mode and an induction mode of operation that is somehow triggered by the presence or absence of superconductivity in these coil modules. No such teaching appears to exist.

Quite to the contrary, *Rabinowitz* teaches that the coil modules need not even be superconducting at all. [4] This is because the function of the coil modules (44) is to establish a pattern field that is ultimately maintained by superconductive material (29) embedded in the torque tube (25).[5]

To operate the *Rabinowitz* machine, a pulse generator (34) energizes the coil modules (44). The induced current in the coil modules generates a magnetic field. When the temperature in the interior of the rotor falls below the critical temperature, the superconductive material (29) in the wall allows the magnetic field to be self-supporting. This magnetic field, which remains trapped within the rotor, interacts with current in the armature winding (8), thereby generating a current in that winding (in the case of a generator) or being rotated by a torque caused by current in that winding (in the case of a motor).

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[4] *Rabinowitz* U.S. 4,176,291, col. 8, lines 30-31 ("[t]he coil modules 44, FIG.2, may be either super-conducting or normal coils").
[5] *Rabinowitz* col. 7, lines 9-21.

Rabinowitz teaches that the machine disclosed in FIGS. 1-3 operates as a synchronous machine.[6] There is, however, no teaching in *Rabinowitz* of the disclosed machine switching from a synchronous mode to an induction made upon failure of a cooling system. Instead, *Rabinowitz* teaches that when the temperature within the rotor rises above the critical temperature for superconductivity, the trapped field can be restored by repeating the trapping process described beginning in column 7, line 9.[7]

Applicant therefore submits that *Rabinowitz* fails to anticipate the subject matter of claim 1 because it lacks a teaching of rotor assembly that switches between a steady-state induction mode and a synchronous mode on the basis of whether or not a winding exhibits superconducting characteristics. Since the remaining independent claims 17 and 21 include this same limitation, the foregoing arguments apply *mutatis mutandis* to those claims. Accordingly, Applicant solicits the Examiner's withdrawal of the §102(*e*) rejection of claims 1, 17, 21, and all claims dependent thereon.

Applicant encloses a check for payment of a fee for a one-month extension of time. If additional fees are due, please charge our Deposit Account No. 06-1050.

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[6] *Rabinowitz*, col. 6, lines 53-59.
[7] *Rabinowitz*, col. 7, lines 36-42.

Respectfully submitted,

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